

Application Number 11/790,707  
Response to Office Action of 10/26/2009

This listing of claims will replace all prior versions and listings of claims in the application:

1-3. (canceled)

4. (currently amended) Apparatus for use in a reduced clock rate finite impulse response filter comprising:

i) Q latch means all coupled to an input data signal having a unit interval rate and each latch means providing a latched output signal in response to a latch control signal;

ii) Q multiplexer/multiplier (mux/mul) means, each mux/mul means providing one output and Q inputs to receive the latched output signal of a respective latch means; and

iii) selection means for controlling said mux/mul means operative to produce an output signal selected from one of said Q inputs;

iv) means to produce a clock signal; and

v) Q phase delay means coupled to said clock signal providing an output latch control signal to a corresponding latch means;

wherein each phase delay means is adapted to produce a unique output latch control signal that is phase delayed from the clock signal by a phase delay of  $N \times 360/Q$ , where unique values of N correspond to each individual phase delay means and range from 0 to Q-1.

5. (currently amended) The apparatus of claim 4 further including:

i) signal conditioning means for each mux/mul means to condition the output signal of the mux/mul means; and

ii) summing means to sum the conditioned signals of all such signal conditioning means.

6. (currently amended) The apparatus of claim 5, wherein said signal conditioning means modifies is adapted to modify the gain and the sign of the output signal of the corresponding mux/mul means.

7. (canceled)

8. (canceled)

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9. (currently amended) The apparatus of claim ~~7~~4, wherein the means to produce a clock signal is adapted to operate to produce ~~operates to produce~~ a clock signal that is a sub-multiple Q of the unit interval rate of said input data signal.

10. (currently amended) The apparatus of claim 4, wherein the selection means is adapted to operate ~~operates~~ to select an output signal from one of said Q inputs at a rate corresponding to the unit interval rate of said input data signal.

11. (canceled)

12. (currently amended) A method for providing a feed forward equalizer (FFE) in a transversal finite impulse response (FIR) filter for transmitting data bits that are shifted through delay elements, ~~at a reference clock rate defining a unit interval period and each delay element is being~~ coupled to a corresponding multiplier and all of the multiplied outputs are summed, the method comprising the steps of:

i) supplying the data bits to be processed to Q shift registers operating at a shift rate that is the quotient of the reference clock rate divided by Q; and

ii) multiplexing said Q shift registers to a FIR FFE multiplier summing network for a unit interval period defined by said reference clock rate such that each shift register of said Q shift registers is successively multiplexed to the FIR FFE multiplier summing network in successive unit interval periods.

13. (currently amended) A method for providing a decision feedback equalizer (DFE) in a transversal finite impulse response (FIR) filter for recovering data bits in a received data signal having a data rate defining a unit interval period ~~comprising the steps of:~~

i) conditioning the received data signal;

ii) supplying the conditioned data signal to Q shift registers of a DFE network, all said shift registers operating at a shift rate that is the quotient of the clock rate of the received data signal divided by Q; and

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iii) multiplexing said Q shift registers to a FIR DFE multiplier summing network\_for a unit interval period defined by said clock rate of the received data signal such that each shift register of said Q shift registers is successively multiplexed to the FIR DFE multiplier summing network in successive unit interval periods.